FINE ADJUSTABLE SLIDING BUCKLE

BACKGROUND OF THE INVENTION

1. The field of the invention

[0001] The present invention relates to a fine adjustable sliding buckle, and more particularly to a fine adjustable sliding buckle comprising a long base having a fine adjustment handle and a releasing plate along the same axial direction, wherein the releasing plate is received in a receiving hole of the fine adjustment handle as in an approximated phase, so that accidental pressing onto the releasing plate can be effective prevented and thus loosening off of the adjustable belt from the base can be effective prevented. Thus, easy operation, safe and fine size-adjustment can be effectively achieved.

2. Description of the related art

[0002] Securing buckles with the adjustable belt are commonly applied in shoes, roller skaters and alike. The securing buckle comprises a base, a releasing plate and an adjustable belt. The releasing plate is generally designed to be able to rotate for releasing from or buckling into the space between the protruded gears of the adjustable belt. Additionally, the buckle may also have a spring to aid for bouncing the releasing plate as it releases from the space between the protruded gears. However, such a design is complicated and difficult to assemble. Besides, because the adjustment belt is positioned within the releasing plate and the base, and therefore it is difficult to fine adjust the belt effectively through visual judgment and then rotating the releasing plate if the user wishes to adjust the length of the adjustment belt again. The user has to feel the belt then

use hands to adjust thereof. When applying such a belt to shoes, the outward stress of the shoe makes the adjustment job even tougher. Therefore, how to improve the overall design and the adjustment manner to substantially achieve easy operation for the user and also reduce the manufacturing cost thereof is an important issue in the field.

[0003] Correspondingly, referring to FIGs. **8** and **9**, the elevational view and exploded view of the conventional buckle, as shown, the buckle comprises an **U**-shaped base **C** that has two side plates with two pairs of axial holes **C3** and **C4**. The axial holes **C3** and **C4** are for fitting the axles **A1** and **B1** formed on the two sides of the releasing plate **A** and the fine adjustment handle **B**, and further to fit the adjustment belt **D** into the button channel **C1** and the track **C2** of the base **C**. The feature of the above structure is that the fine adjustment handle **B** has a resilient arch-shaped resilient supporting plate **B2** formed extending from the distal end of the inner side thereof, when rotating the fine adjustment handle **B**, the distal end of the resilient supporting plate **B2** is vertically buckled into the space between the protruded gears **D1** of the adjustment belt **D**, thus the adjustment belt **D** is moveable within the distance of a gear each time. When back the fine adjustment handle **B** is rotated, the arch-shaped of the resilient supporting plate **B2** is resiliently deformed along the slope of the space between the protruded gears **D1** of the adjustment belt **D** to return to the position.

[0004] The buckle depicted above has some fine adjustment function, easy assembly and easy operation.. However, the releasing plate **A** and the fine adjustment handle **B** are positioned on the two sides of the base **C**, and therefore the overall space occupation is correspondingly larger. Thus, the application of such a buckle is limited, for example, for its application in a shoe, a bag, a backpack or other items, invariably

requires the user to make some adjustment. Besides, when using the fine adjustment handle **B**, the user may accidentally touch the releasing plate **A** releasing the adjustment belt **D** from the base **C** that would require unnecessary re-setting of the belt. If the user has already worn the shoe and the adjustment belt **D** is accidentally released from the base **C** through an accidental touch of the releasing plate **A**, it may hurt the user's ankle or trip the user while walking or running as the shoe is still fitted on the foot of the user. Therefore, the design of the above described conventional buckle still need to be improved for overcoming the above defects.

SUMMARY OF THE INVENTION

[0005] Accordingly, in the view of the foregoing, the present inventor makes a detailed study of related art to evaluate and consider, and uses years of accumulated experience in this field, and through several experiments, to create a new fine adjustable sliding buckle in order to overcome the above defects. The present invention provides a novel and cost effective fine adjustable sliding buckle.

[0006] According to an embodiment of the present invention, a fine adjustable sliding buckle is provided. The fine sliding adjustable buckle comprises a base having two pairs of axial holes respectively for axially fitting the axles of the releasing plate and fine adjustment handle. The axles positioned on the two sides of the fine adjustment handle and the releasing plate are fitted in the axial holes on the same side of the base, and the handling portion of the fine adjustment handle has a receiving through hole for receiving the releasing plate. Thus the fine adjustment handle and the releasing plate are positioned along the same direction and are positioned almost on the same plane to prevent accidental touch which would otherwise accidentally release the releasing plate

from the base to loosen the adjustment belt. Thus, the fine adjustable sliding buckle of the present invention is easy to operate, safe and compact.

BRIEF DESCRIPTION OF THE DRAWING

[0007] For a more complete understanding of the present invention, reference will now be made to the following detailed description of preferred embodiments taken in conjunction with the accompanying drawings.

[0008] Fig. **1** is an elevational view of a fine adjustable sliding buckle according to a preferred embodiment of the present invention.

[0009] Fig. **2** is an exploded view of the fine adjustable sliding buckle according to a preferred embodiment of the present invention.

[0010] Fig. **3** is an explored side view of the fine adjustable sliding buckle according to a preferred embodiment of the present invention.

[0011] Fig. **4** is an explored side view of an adjustment belt and a base of the fine adjustable sliding buckle according to a preferred embodiment of the present invention.

[0012] Fig. **5** is the side view of the fine adjustment handle during operation thereof of the fine adjustable sliding buckle according to a preferred embodiment of the present invention.

[0013] Fig. **6** is the side view of the adjustable belt of the present invention during the operation thereof to a certain position.

[0014] Fig. **7** is the side view of the motion of the releasing plate of the present invention.

[0015] Fig. **8** is the elevational view of the conventional buckle.

[0016] Fig. **9** is the explored view of the conventional buckle.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0017] Reference will be made in detail to the preferred embodiments of the invention, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers are used in the drawings and the description to refer to the same or like parts.

[0018] Referring to FIGs. **1**, **2** and **3**, the elevational view, the exploded view and the exploded side view of the fine adjustable sliding buckle according to a preferred embodiment of the present invention are illustrated. The fine adjustable sliding buckle comprises a releasing plate **1**, a fine adjustment handle **2**, a base **3** and an adjustment belt **4**.

[0019] The releasing plate **1** is formed as an integral unit, and has a pair of corresponding axles **11** on each side. Two axles **11** are formed at a bottom side of a buckling portion **12** and a resilient plate **13** is formed at a backside of the axels **11**.

[0020] The fine adjustment handle **2** is an arch-shaped plate and has a protruded point **21** on the two sides thereof. At the outer side of the protruded point **21** has two pair of corresponding axles **22**, and the axles **22** have an arch-shaped resilient supporting plate **23** extending from the distal end of the fine adjustment handle **2**. Additionally, the handling portion **25** of the fine adjustment handle **2** has an arched bottom face and a receiving hole **24** for receiving the releasing plate **1**.

[0021] The base **3** is a long U-shape plate, which has a through channel **31** formed at a bottom part between the two sides. Axial holes **33** are correspondingly formed at the frontal side of rear sidewalls of the base **3**, and securing holes **32**, axial holes **34** and

supporting block **35** formed respectively from the left to the right of the base **3**. An arch portion **36** is formed at the top face of the two sidewalls of the base **3**, wherein the arch portion **36** allows the arched bottom face of the handling portion **25** of the fine adjustment handle **2** to lean against a top face of the two sidewalls of the base **3**.

[0022] Furthermore, the adjustment belt **4** is a long structure having a plurality of protruded gears **41** formed on the surface thereof.

[0023] To assemble the embodiment of the present invention, the two axles **22** of the fine adjustment handle **2** are fit into the two corresponding axial holes **33** of the base **3**, and the protruded points **21** formed at the rear side of the axles **22** are buckled into the securing holes **32**. Next, the two axles **11** of the releasing plate **1** are fit into the axial holes **34** of the base **3**. The resilient plate **13** extending from the two axles **11** can support against the surface of the supporting block **35** of the base **3** and makes the releasing plate **1** to position in the receiving hole **24** of the fine adjustment handle **2** such that the releasing plate **1** is almost in the same plane of the fine adjustment handle **2**. Thus, this arrangement allows the releasing plate **1** and the fine adjustment handle **2** to operate at the same side of the base **3**. Furthermore, by pressing on the unsupported portion of the releasing plate **1**, the adjustment belt **4** from the through channel **31** can be fit into the base **3**.

[0024] Now referring to FIGs. **4**, **5** and **6**, the exploded side view of the adjustment belt and the base, the side view of the fine adjustment handle according a preferred embodiment of the present invention, and the side view of the adjustable sliding belt during the operation are illustrated. To apply the present invention, the adjustment belt **4** faced to the through channel **31** of the base **3**, meanwhile, the buckling portion **12** of the

releasing plate **1** is fitted into the space between any two protruded gears **41** of the adjustment belt 4. When the user wishes to adjust the position of the adjustment belt **4** (referring to FIG. **4**), the user can move the fine adjustment handle **2** along the reverse clock direction along with the axles **22** formed on the two sides of the fine adjustment handle **2** as the axis. Thus the vertical face between any two of the protruded gears **41** can be pushed by the resilient supporting plate **23** of the fine adjustment handle **2** for further moving the adjustment belt **4** forward through the distance of any one protruded gear **41**, then move the fine adjustment handle **2** along the clock-wise direction to make the arched face of the resilient supporting plate **23** to come in contact with the slope of the protruded gear **41** which will resiliently deform and then return to the original position. Additionally, the two protruded points **21** formed at the outer side can be pressed into the two securing holes **32** of the base **3** for positioning, meanwhile, the handling portion **25** of the fine adjustment handle **2** is made to lean against the arch portion **36** of the base **3**. When the user wishes to pull out the adjustment belt **4**, as shown in fig. **7**, the user needs to just press the outer part of the unsupported portion of the releasing plate **1**. In doing so, the axle **11** of the releasing plate **1** will move axially making the buckling portion **12** of the releasing plate **1** to move upwardly to escape from the space between the two protruded gears **41** of the adjustment belt **4**. Accordingly, the user can easily move or pull out the adjustment belt **4**. Besides, when pressing the releasing plate **1**, the two resilient plates **13** can resiliently deform by supporting against the supporting block **35** of the base **3**, so the user can elastically move or pull out the adjustment belt **4** due to the elasticity of the two resilient plates **13**, and as well, the

releasing plate **1** will return to the original position, that is, the position before being pressed.

[0025] Further referring to FIG. **7**, the side view of the motion of the releasing plate of the present invention. As shown in FIG. **7**, the releasing plate **1** and the fine adjustment handle **2** are set at the same side of the base **3**, thus the overall space occupation can be substantially smaller, and the user only needs to use one hand to move the releasing plate **1** and press the fine adjustment handle **2**. The releasing plate **1** and the fine adjustment handle **2** are operative in opposite direction, and the releasing plate **1** is positioned in the receiving hole **24** of the fine adjustment handle **2**. Therefore, when the fine adjustment handle **2** is idle, the fine adjustment handle **2** can effectively protect the releasing plate **1** from being pressed by any external force, and therefore the adjustment belt **4** will not accidentally come loose from the base **3**. The fine adjustable sliding buckle of the present invention substantially has the practical useful features, such as easy and safe operation, and smaller space occupation.

[0026] While the invention has been described in conjunction with a specific best mode, it is to be understood that many alternatives, modifications, and variations will be apparent to those skilled in the art in light of the foregoing description. Accordingly, it is intended to embrace all such alternatives, modifications, and variations in which fall within the spirit and scope of the included claims. All matters set forth herein or shown in the accompanying drawings are to be interpreted in an illustrative and non-limiting sense.